RIVERS AND FLOODS, JANUARY, 1913.

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Barometric depressions during January, 1913, after reaching the Mississippi Valley, almost without exception assumed the form of an elongated ellipse, or trough of low pressure; these depressions had a very slow drift from the southwest to the northeast, or almost parallel with the course of the Ohio watershed, and they succeeded one another with a regularity not often experienced in the winter season. As a result the temperature in the interior valleys and the eastern part of the United States was unduly high, the prevailing winds being southerly, from the Gulf of Mexico, were moist and thus ideal conditions prevailed for abundant rainfall throughout the paths of the slowly moving depressions above mentioned. To what extent these conditions were realized may be seen by an inspection of Precipitation Chart No. V, which is a part of this Review. The locus of the heavy rains in the early part of the month was in the lower Ohio Valley, including Tennessee, Arkansas, and the northern portion of the Gulf States. Toward the end of the month the locus of heavy rain seemed to shift a little farther northward so as to embrace, in addition to the immediate lower Ohio Valley, the States of Ohio, Indiana, and Illinois.

The above-described depressions and the precipitation attendant upon them arrived over the Ohio Valley and adjacent regions to the southwest and south in such sequence and with such a short time interval separating them as to make damaging floods in the Ohio and its tributaries inevitable. That the floods in the Ohio River were not more severe was due primarily to two facts, as follows: First, the ground was not frozen and the run-off was therefore not so great as it might have been and, second, there was an absence of snow over the watershed that very much modified and lessened the danger of the situation. Another point of dissimilarity between the January, 1913, flood and previous floods was the fact that the first named was a rain flood in which the bulk of the rain fell over the watershed on the north bank of the river. It is true that heavy rains also fell in Kentucky and Tennessee during the first half of the month but during the last half of the month the heavy rains which fell over Ohio, Indiana, and Illinois were fortunately not coincident with heavy rains over the southern tributaries. It was to the heavy rains over the treeless States of Ohio, Indiana, and Illinois that both the intensity and duration of the flood in the lower Ohio was due. It is estimated that at least 4 feet of the stage on the Cairo gage was due to water contributed by the White and Wabash Rivers. In the upper reaches of the river there were two distinct flood waves, the first one passed Pittsburgh, Pa., on the 9th with a crest stage of 31.3 feet, nearly 4 feet below the flood of March, 1907. The second wave was less severe and farther down river it was not noticed.

At Cincinnati a crest stage of 62.2 feet was reached on the 15th and a portion of the water at this stage was due to local rains which fell over the immediate watershed near Cincinnati. From Cincinnati to Cairo and especially at the latter point, the stage of the river was continually being increased and the high stages prolonged by heavy local rains over the immediate watershed of the river, especially over the watershed in Indiana and lower Illinois. At the end of the month the flood was passing into the Mississippi River at Cairo and the Ohio at that point was falling. Fortunately for the dwellers along the Mississippi that stream was low when it received the Ohio flood, otherwise a repetition of the experiences of 1912 might have been probable. For further details of the Ohio flood see the report of Prof. F. J. Walz, district editor (No. 3).

Elsewhere in the United States the rivers were within bounds, except in the Carolinas, Alabama, and Mississippi, where they passed flood stages during the last week of the month. Floods also occurred in the White River and the Black River of Arkansas and in the Ouachita River at Camden, Ark. Further details of these floods are communicated in the reports of District Editors Von Herrmann and Cline, respectively.

SUMMARY OF MONEY LOSS OCCASIONED BY THE OHIO FLOOD.

Efforts have been made to secure details of money loss by the Ohio flood that shall be more accurate than the crude guesses sometimes made. From the nature of the case nothing short of a census of the devastated districts will yield accurate returns of the loss suffered, yet where the loss and damage are confined to the congested river districts of large cities, fair estimates of certain classes of loss or damage may be obtained; for example, those due to actual loss of or damage to tangible property as well as the money spent in cleaning up basements and cellars and in putting machinery in serviceable condition may be readily computed.

Money value of property destroyed or damaged in Ohio River flood of January, 1913.

From above Pittsburgh to Wheeling	$500,000.00
Parkersburg district	20,000.00
Cincinnati district	106,000.00
Louisville district	200,000.00
Evansville to Cairo	100,000.00
Total for Ohio River	926,000.00
Other watersheds tributary to the Ohio:	
Cumberland River (Nashville district)	164,070.00
White and Wabash Rivers	81,000.00
Total	245,070.00
Total for Ohio watershed	1,171,070.00
Property loss in all other districts:	
White River of Arkansas	20,000.00
Rivers of South Carolina	3,500.00
Total	23,500.00
General property loss excluding crops and loss due to suspension of business, grand total	1,194,570.00
Loss to crops:	
Nashville district (Cumberland River)	11,650.00
Indiana and Illinois (Indianapolis district)	54,500.00
Kentucky (Louisville district)	50,000.00
Total crop loss	116,150.00

Money loss due to suspension of business, loss of wages, etc.:	
Pittsburgh district	$150,000.00
Cincinnati district	400,000.00
Louisville district	100,000.00
Nashville district	65,750.00
Indiana and Illinois	34,500.00
South Carolina rivers	4,000.00
Total loss due to suspension of business, etc	754,250.00
Grand total of all losses	2,064,970.00

The above is probably not overestimated, considering the far-reaching effects of the flood and the impossibility of getting accurate returns from remote quarters. It is probable, however, that such losses as have been reported are somewhat exaggerated, since there is an element in human nature which tends toward an overstatement of one's own personal loss. On the other hand it must be considered that Weather Bureau officials have not the means at their disposal to make a thorough canvass of the loss sustained. The official in charge of the Cincinnati district undertook to collect data of loss and damage by means of circular letters of inquiry mailed to persons in the flood-swept districts; he was obliged, however, to admit that his statistics so collected probably included only about 90 per cent of the actual loss. The large loss to crops reported from Indiana and Illinois was based on the probable destruction of the crop of wheat on the overflowed lands in those States. Whether that crop will be a total loss or not is yet problematical.

Hydrographs for typical points on several principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.